

مراجعة

كيمياء عضوية Chem 111

لطلاب السنة التحضيرية بجامعة الملك خالد بأبها – المحالة

2015

عمل تطوعي طلابي

لا تنسى زيارة المدونة http://kku-a.blogspot.com

و نشر المدونة بين الطلاب لتعم الفائدة

أعتذر عن رداءة جودة الصور ولكن الصور تم تصويرها بواسطة جوال ثم طبعت و صورت عدة مرات وهكذا ، الحلول من عمل الأستاذ صلاح .

أغلب الأسئلة هي من اختبارات التيرم الأول لسنة 2014-2015

أتمنى لكم التوفيق



Kingdom of Saudi Arabia

Ministry of Higher Education

King Khalid University

Joint Programs, Healthy Sciences Program

First Mid-term Exam - Organic Chemistry - Chem 112

Date: 9/1/1436

Name (in Arabic): ______________________ Time: 60 min

University number: ______________________

Model 2

<u>Choose the correct answer: (20 question & 4 pages)</u>

(1) The valence electrons (outer shell electrons) of $_{7}^{14}N$ is

a) 5 b) 4 c) 3 d) 2

(2) Which of the following orbital pairs is degenerate?

a) $2p_x$ and $2p_y$ b) 2s and $2p_x$ c) 2d and $2p_z$ d) 1s and 2s

(3) The number of tertiary carbon in (2-Methyl-4-isopropylheptane) is:

a) 0 b) 4 c) 3 d) 2

(4) How many Hydrogen atoms in this formula?

a) 6

b) 8

c) 4

d) 5

HO OH O O HO OH

Vitamin C

(5) What is the maximum number of covalent bonds that the carbon atom can form?

a) 3 b) 4 c) 1 d) 2

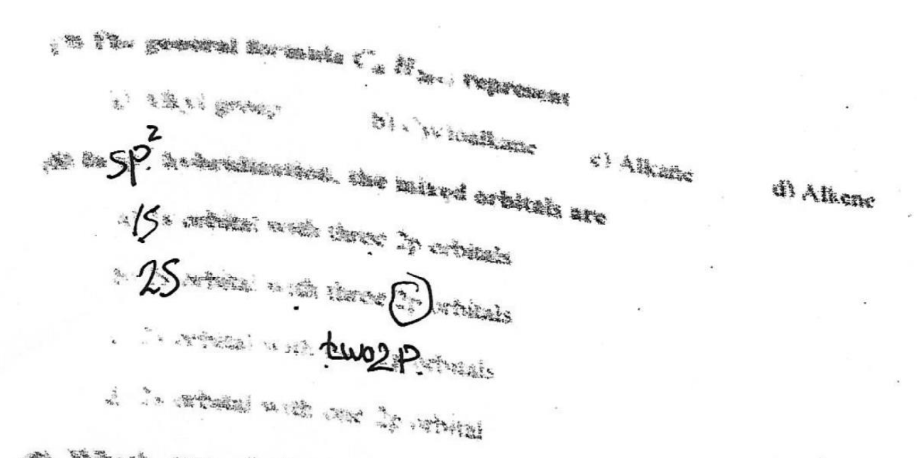
(6) Which of the following compounds has the lower boiling point?

a) Hexane

b) 2-Methylpropane

c) 2,3-Dimethylpentane

d) 2-Methylpentane



(7) The general formula C_nH_{2n+1} represent

a) Alkyl group b) Cycloalkane c) Alkane d) Alkene

(8) In sp² hybridization, the mixed orbitals are

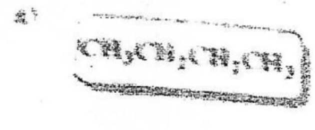
a) 1s orbital with three 2p orbitals

b) 2s orbital with three 2p orbitals

c) 2s orbital with two 2p orbitals

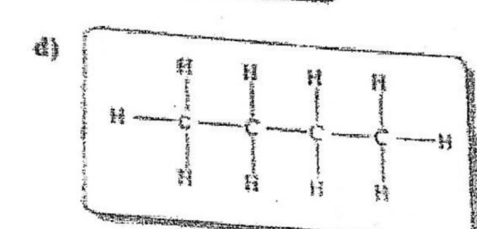
d) 2s orbital with one 2p orbital

(9) Which one of the following structural formulas represents bond-line structural formula?

a) 

b) 

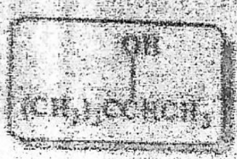
c) $CH_3(CH_2)_2CH_3$

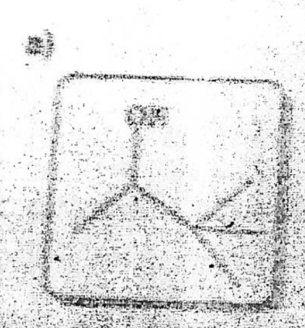
d) 

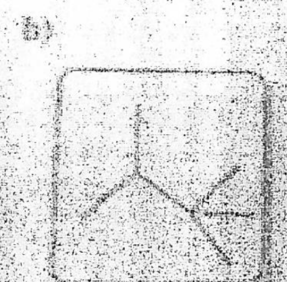
(10) What is the value of x in C_9H_x (cycloalkane)

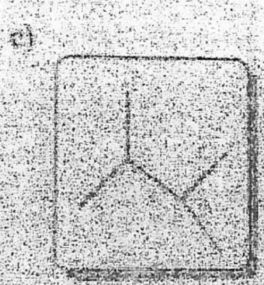
a) 8 b) 16 c) 18 d) 20

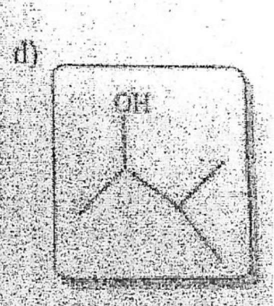
(11) Which of the following bond-line structural formula represent the following condensed structural formula?



a) 

b) 

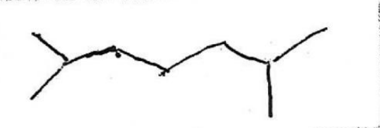
c) 

d) 



12. Which of the following condensed structural formulas represents the following bond-line structural formula?

$(CH_3)_2CH(CH_2)_3CH(CH_3)CH_3$

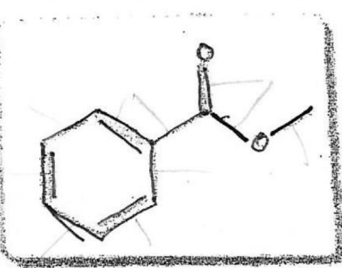


a) $(CH_3)_2CH(CH_2)_3CHCH_2CH_3$ [illegible]

b) [illegible] c) [illegible]

13. How many sigma (σ) bonds are present in the following molecule?

a) 8
b) 14
c) 10
d) 18 ✓



(14) How many pi (π) bonds are present in 2-Methylpentane?

a) 3 b) 0 c) 1 d) 2

خطأ

(15) What is the molecular formula of 3-Methyl-3-propylpentane?

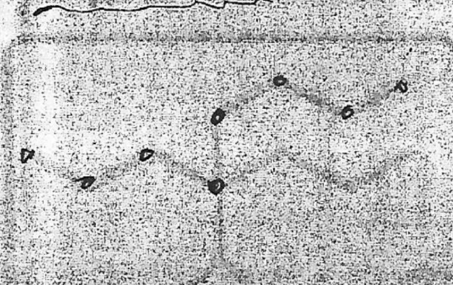
a) C_8H_{18} b) C_9H_{20} c) [illegible] d) [illegible]

(16) What is the common name of 2-Methylpropane?

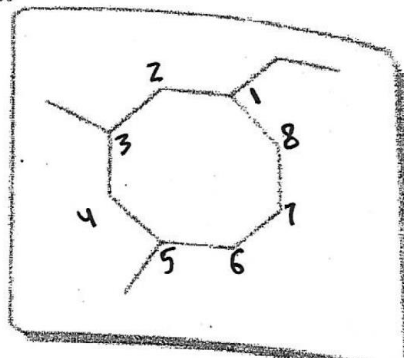
a) Isopropane b) Isobutane c) Isopentane d) Neopentane

(17) How many carbon atoms in the parent chain of the following compound?

a) 6
b) 7
c) [illegible]
d) None of the above



(18) The IUPAC name of the following compound is:



a) 1,3-Dimethyl-5-ethylcyclooctane

b) 1-Ethyl-3,5-dimethylcyclooctane

c) 1-Ethyl,3-5,dimethylcyclooctane

d) 1-Ethyl-3,5-Dimethylcyclooctane

(19) Neopentane and 2-Methylbutane represent:

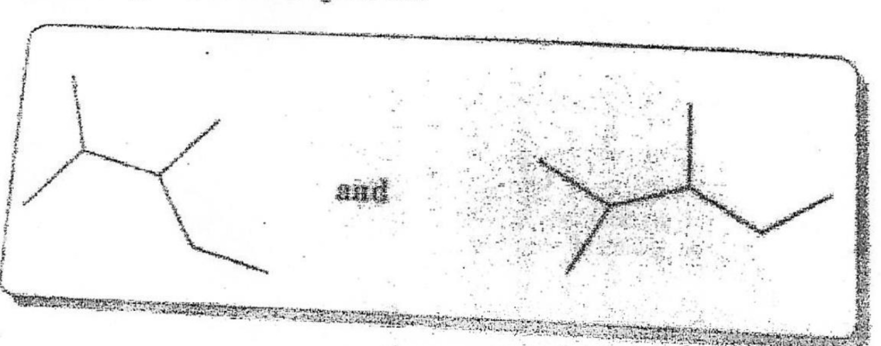
a) Different compounds

b) Constitutional isomers

c) Structural isomers

d) All correct

(20) The following formulas represent



a) Chain isomers

b) Positional isomers

c) Same compound

d) Geometrical isomers

1 a
2 a
3 c
4 b
5 b
6 b
7 a
8 c
9 b
10 b
11 a
12
13 d
14 b
15 b
16 b
17 c
18 b
19) d
20 c

Chose the correct answer:(20 question & 4pages)

1- Which of the following species represents nucleophile?

a) Cl^- b) H^+ c) $Cl^•$ d) a+c

2- If H-Br bond is cleaved in heterolytic way it produces -----

a) H^+ as electrophile and Br^- as nucleophile
b) H^- as nucleophile and Br^+ as electrophile
c) $H^•$ as free radical and $Br^•$ as free radical
d) H^+ as nucleophile and Br^- as electrophile

3- Which of the following statement is *incorrect* according to chlorination of ethane (halogenation)?

a) It is give one product b) It is a substitution reaction

c) It is a free radical reaction d) It is non catalyzed reaction

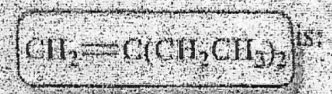
4- Which of the following statement is *TRUE* for alkenes?

a) Saturated hydrocarbons with one or more double bond.
b) Unsaturated hydrocarbons with one double bond.
c) Unsaturated hydrocarbons with one double bonds.
d) Cyclic compounds.

5- Ocimene is a triene found in the essential oil of many plants. How many π- bonds in ocimene?

a) 3 b) 2 c) 10 d) 6



6- The IUPAC name of the following alkene  is:

$CH_2{=}C(CH_2CH_3)_2$

a) 2-Ethylbutene b) 2-Ethyl-1-butene

c) 1-butene d) 2-Methy-1-pentene



7-The IUPAC name of the following alkene is:



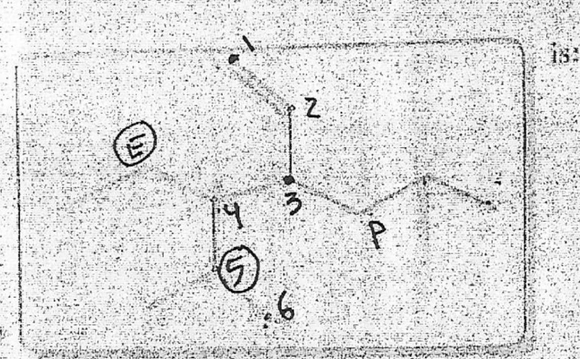
a) 2-Methyl-4-pentene

b) Cis-4-methyl-2-pentene

c) Cis-2-methyl-3-pentene

d) 4-Methyl-2-pentene

8-The IUPAC name of the following alkene is:



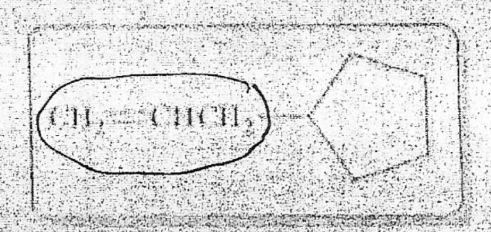
a) 3-Ethyl-5-methyl-4-vinylheptane

b) Cis-4-Ethyl-5-methyl-3-propyl-1-hexene

c) 4-Ethyl-5-methyl-3-propyl-1-hexene

d) Trans-4-ethyl-5-methyl-3-propyl-1-hexene

9-The common name of the following compound is:



a) Vinylcyclopentane

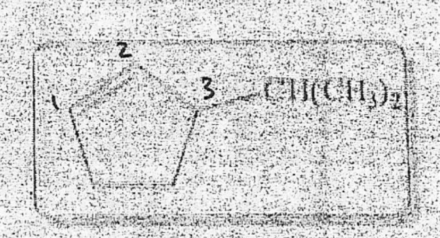
b) 2-Propenylcyclopentane

c) Allylcyclopentane

d) Cyclopentylpropene



10-The name of the following alkene is:



a) 1-Isopropyl-2-cyclopentene

b) 3-Isopropylcyclopentane

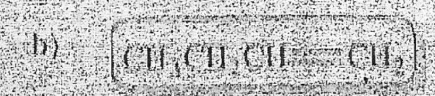
c) 3-Isopropylcyclopentene

d) 2-Isopropylcyclopentene

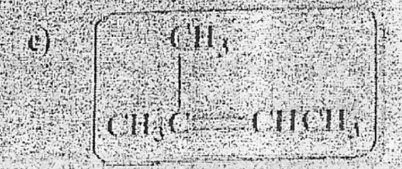
11-Which of these compounds *not* exhibit geometric isomerism?

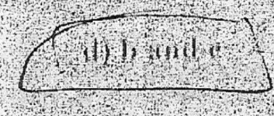
a) $CH_3CH_2CH=CHCH_3$

b)



c)





12-*Cis* and *trans* isomers can be classified as:

a) Same compounds (b) Geometrical isomers c) Structural isomers d) b+c

13-Which of the following statement is ***INCORRECT*** for hydrogenation of alkenes:

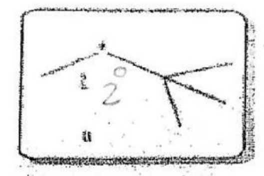
(a) It is an electrophilic addition reaction

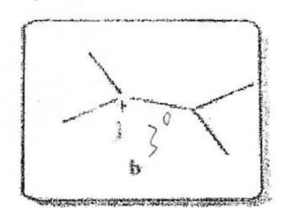
b) Platinum act as catalyst

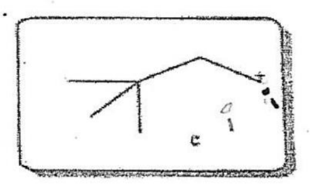
c) Convert unsaturated hydrocarbon to saturated hydrocarbon

d) It is an addition reaction

14-Arrangement of the following carbocations in order of increasing stability:

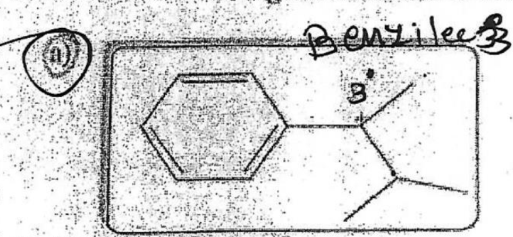
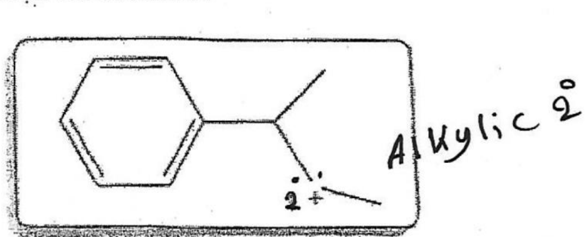


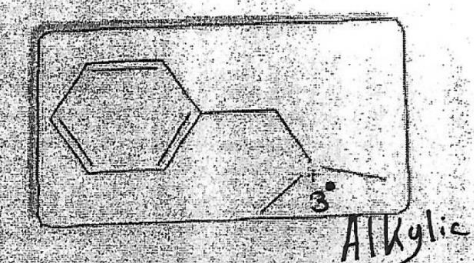
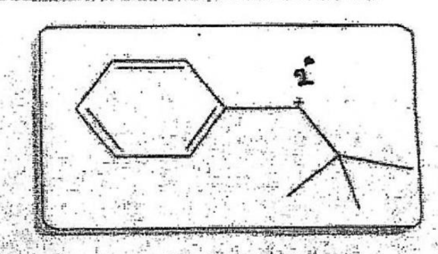




a) a < b < c b) b < c < a c) b < a < c (d) c < a < b

15-Which of the following carbocations is the most stable carbocation:

(a)  b) 

c)   d) 

16-The main product of the following reaction is:



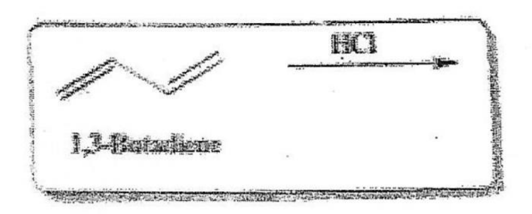
a) 2-Bromohexane b) 3-Bromohexane c) 1,2-Dibromohexane (d) a+b



17-The diene in which the double bonds are alternative with single bonds is called: متبادلة

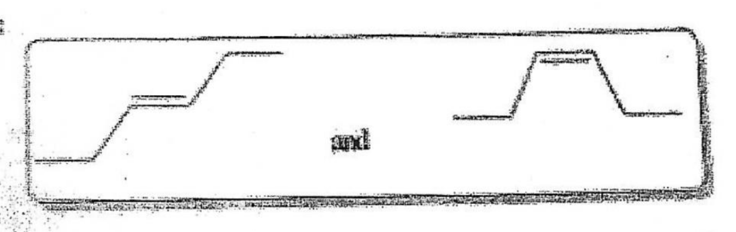
a) Conjugated dienes
b) Cumulated dienes
c) Isolated dienes
d) a+b

18-The following reaction give:



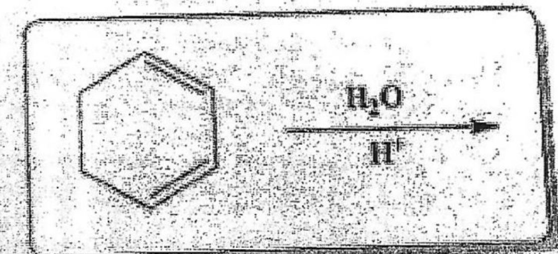
a) 3-Chloro-1-butene
b) 1-Chloro-2-butene
c) 4-Chloro-1-butene
d) a and b

19-These two compounds are:



a) Positional isomers
b) Constitutional isomers
c) Chain isomers
d) Geometrical isomers

20-How many product(s) in the given reaction



a) 3
b) 2
c) 1
d) 0



(1) لاحظ الرمز الذي عليه شحنه سالبه يسمى nucleophile
اما الذي عليه " موجبه " electrophile

(2) a

(3) d

(4) a

(5) a

(6) d هذه الفقرة لابد من رسم التركيب البنائي للمركب ثم تسميته

(7) d

(8) C انتبه عند التسميه لاختيار أطول سلسله

(9) C انتبه ان الرمز $CH_2=CHCH_2$ شعره يسمى Allyl بالشائعه
2-Propenyl وفقا للنظام IUPAC

C

(10) C انتبه للتفرع $CH(CH_3)_2$ يسمى Isopropyl

(11) d

(12) b

(13) a لاحظ ان تفاعل الهيدروجين مع الالكين لا يعتبر electrophilic

(14) d لاحظ ان الترتيب حسب الاستقرار 1° أقل من 2° أقل من 3°

(15) a لاحظ انه كي يكون الكربوكاتيون Benzylic لابد ان الشحنه الموجبه تكون على ذرة الكربون المتصله بالحلقه مباشرة

16	d	لاحظ تساوي C = C في عدد H واختلافهم في الألكيل المتصل بكل ذره عن الأخرى ∴ يعطي ناتجين
17	a	لاحظ ان كلمة alternative تعني متبادله
18	d	لاحظ ان الإضافه على الداين تتم على الموضع 1 و 2 1 و 4
19	d	لاحظ ان احد المركبين cis والآخر trans
20	c	بإضافة H^+ و OH^- على الموضعين 1 و 2 وعلى 1 و 4

ثم قم بتسمية المركبين ستجد نفس الاسم ∴ الناتج مركب واحد.

Date:1/5/1435

Name (in Arabic) :

Section number:

Serial number

Choose the correct answer:(20 question & 5 pages)

1- Mass number equal to---------

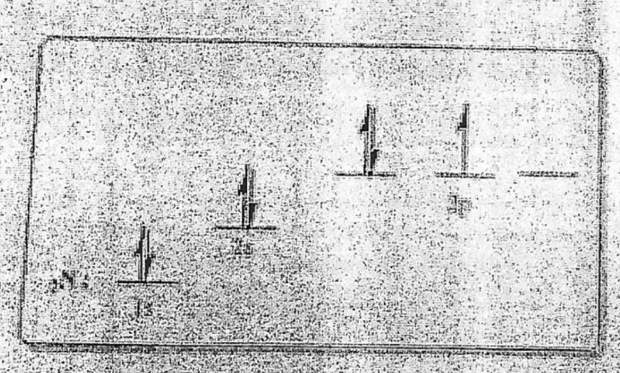
a) Number of protons
b) Number of neutrons
c) Number of electrons
d) a+b

2- Which of the following orbital is not possible

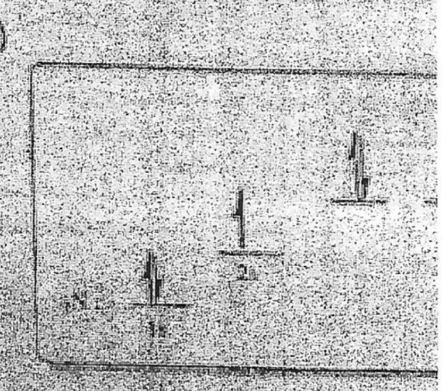
a) 1s b) 2s c) 2p **d) 2d**

3- The best electronic configuration of Nitrogen (Atomic number of N =7) is:

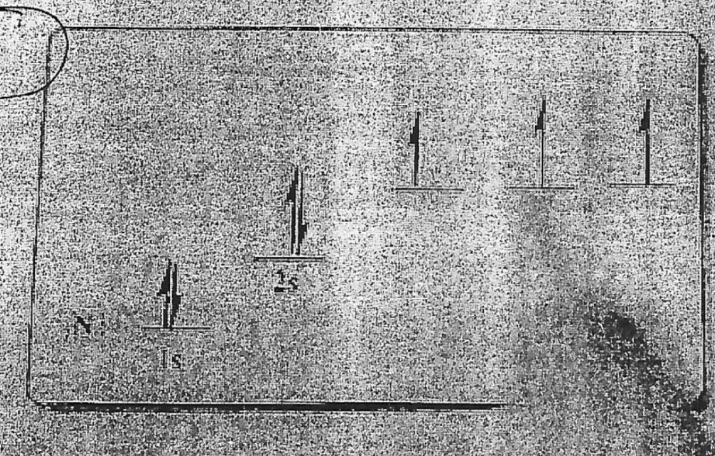
a)



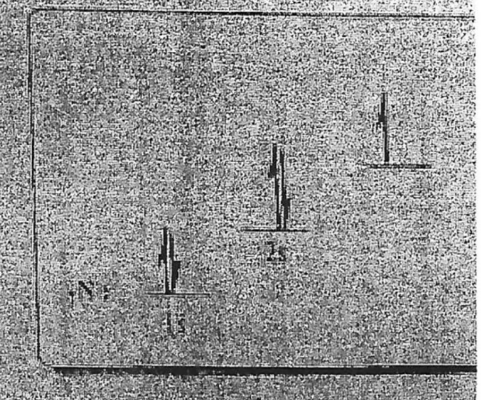
b)



c)



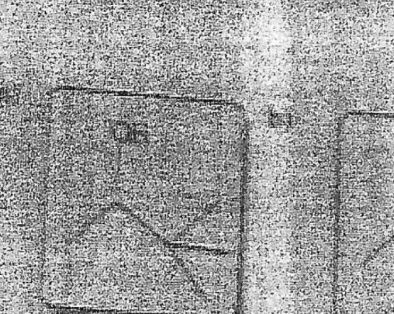
d)

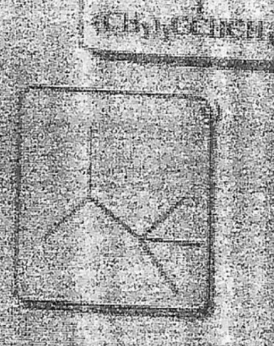


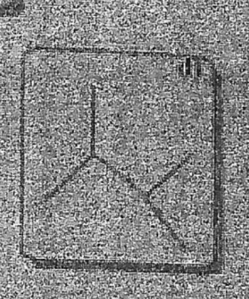


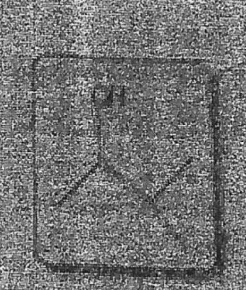
8- Which of the following bond line structural formula represent the following condensed structural formula

CH_3
|
$(CH_3)_3CCHCH_3$

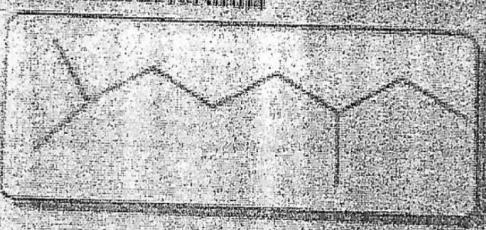
a) 

b) 

c) 

d) 

9- Which of the following condensed structural formula represent the following bond line structural formula



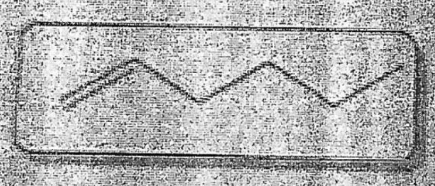
a) $(CH_3)_2CH(CH_2)_3CHCH_2CH_3$

b) $(CH_3)_2CH(CH_2)_3CHCH_2CH_2CH_3$

c) $CH_3(CH_2)_4CH(CH_3)CH_2CH_3$

d) $(CH_3)_2(CH_2)_3CH(CH_3)_2CH_2CH_3$

10- How many sigma (σ) and pi (π) bonds are present in the following molecule?



a) 5 σ, 1 π b) 17 σ, 1 π c) 15 σ, 1 π d) 18 σ, 2 π

11- How many pi (π) bonds are present in 2-Methylpentane?

a) 0 b) 1 c) 2 d) 3

12- The C- hybridization in Ethane

a) Sp b) sp² c) sp³ d) No hybridization

13- The H-C-H angle in ethane is

a) 109.5° b) 120° c) 180° d) 104.5°

2 4 3 = 5

14- What is the molecular formula of 1,1-Dimethylpropane?

a) C_4H_{10} b) C_3H_8 c) C_5H_{12} d) C_6H_{14}

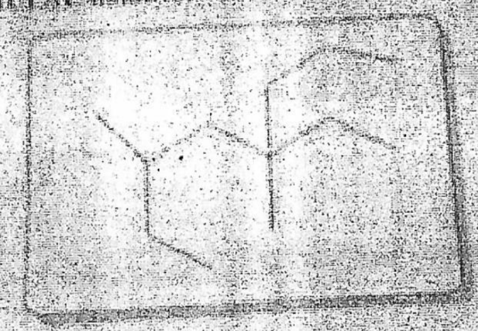
C_5H_{12}

15- What is the common name of the following compound



a) Isopropane b) Isobutane c) Isopentane d) Neopentane

16- Give the IUPAC name for the following compound



a) 5-Ethyl-3,5-dimethyloctane

b) 4-Ethyl-4,6-dimethyloctane

c) 3-propyl-3,5-dimethylheptane

d) 2-Ethyl-4-methyl-4-propylhexane





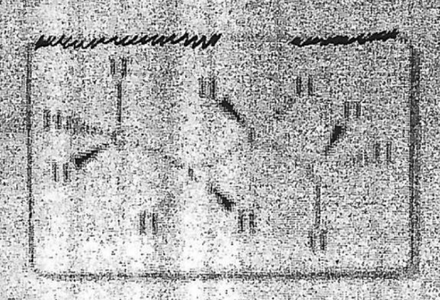


17- Give the IUPAC name for the following compound:



a) Decane
b) 2,2,3,3-Tetramethylhexane
c) 2,3-Dimethyloctane
d) 1,2-Dimethylheptane

18- Give the IUPAC name for the following compound



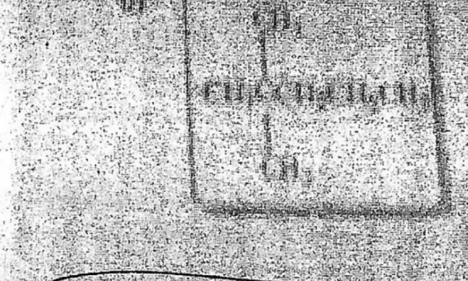
a) 2-Methylpropane b) 3-Methylpropane c) Butane d) Propane

19- The structure of 3-Ethyl-3-Methylpentane is

2,4-Dimethylhexa

a) $CH_3CH_2CH_2CH_2CH_3$

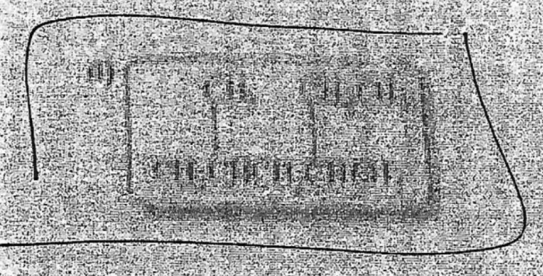
b)



c)



d)

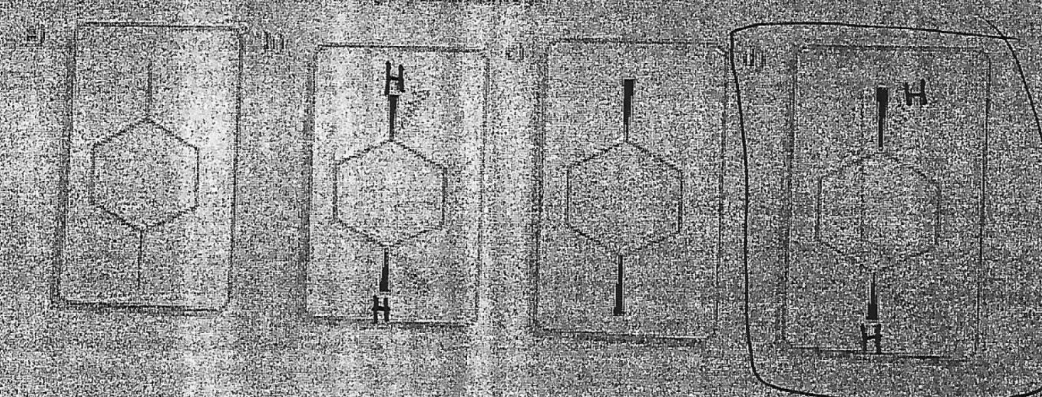


(3) The IUPAC name of this compound



a) 1-Propyl-3-methylcyclopentane
b) 1-Methyl-3-propylcyclopentane
c) 1-Methyl-4-propylcyclopentane
d) 1-Propyl-4-methylcyclopentane

(4) The structure of trans-1,4-dimethylcyclohexane is



(5) Which of the following alkanes have the highest boiling point?

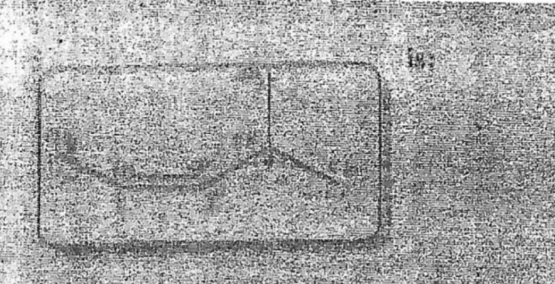
a) Hexane
b) 2-Methylpentane
c) Heptane
d) 2,3-Dimethylpentane

(6) The following formulas represent:



a) Chain isomers
b) Geometrical isomers
c) Positional isomers
d) Same compound

7-The IUPAC name of the following alkene is:



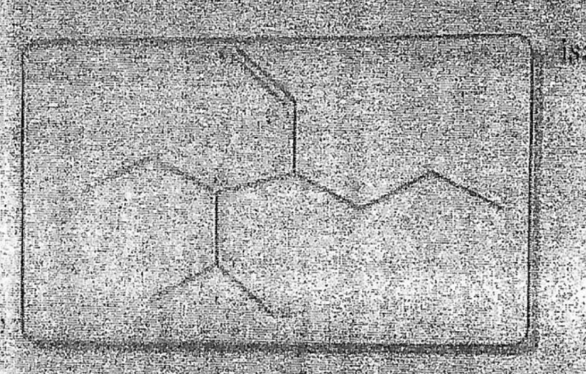
a) 2-Methyl-3-pentene

b) Cis-4-methyl-2-pentene

c) Cis-2-methyl-3-pentene

(d) 4-Methyl-2-pentene

8-The IUPAC name of the following alkene is:



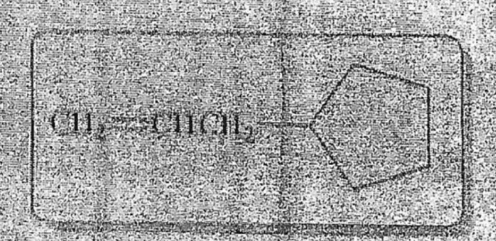
a) 3-Ethyl-5-methyl-4-vinylheptane

b) Cis-4-Ethyl-5-methyl-3-propyl-1-hexene

(c) 4-Ethyl-5-methyl-3-propyl-1-hexene

d) Trans-4-ethyl-5-methyl-3-propyl-1-hexene

9-The common name of the following compound is:



a) Vinylcyclopentane

b) 2-Propenylcyclopentane

(c) Allylcyclopentane

d) Cyclopentylpropene


10-The name of the following alkene is:



a) 1-Isopropyl-2-cyclopentene

b) 3-Isopropylcyclopentane

c) 3-Isopropylcyclopentene

d) 2-Isopropylcyclopentene

11-Which of these compounds *not* exhibit geometric isomerism?

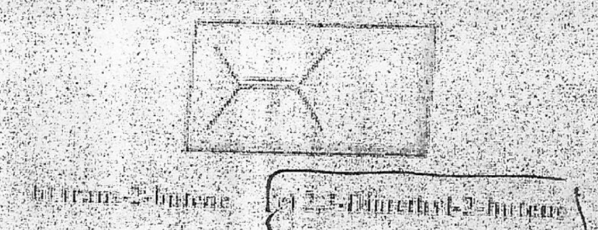
a) $CH_3CH_2CH{=}CHCH_3$

b) 

c) $CH_3C(CH_3){=}CHCH_3$

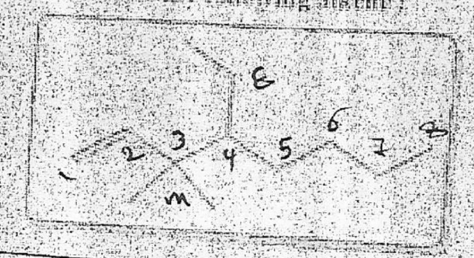
d) b and c

(11) The IUPAC name of this compound is



a) cis-2-butene   b) trans-2-butene   c) 2,3-Dimethyl-2-butene   d) Isobutene

(12) The IUPAC name of the following alkene :



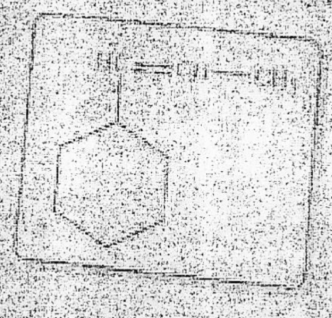
a) 4-Ethyl-3,3-dimethyl-1-octene

b) 3,3-Dimethyl-4-ethyloctene

c) 4-Ethyl-3,3-dimethyloctene

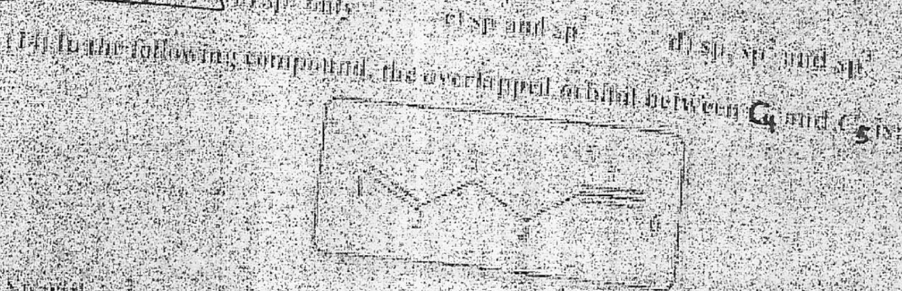
d) 3,3-Dimethyl-4-butyl-1-hexene

(13) The type of hybridization exhibited by each carbon atom in



a) sp^2 and sp^3 b) sp^2 only   c) sp and sp^3 d) sp, sp^2 and sp^3

(14) In the following compound, the overlapped orbital between C_4 and C_5 is:



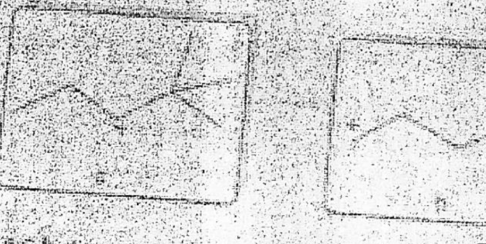
a) Sp with sp^2 b) sp^2 with sp^3 c) sp with sp^3 d) sp^2 with sp^2


(15) These two compounds are:



a) Different compounds
b) same compounds
c) Structural isomers
d) Geometrical isomers

(16) The best arrangement of the following carbocations in order of increasing stability is?

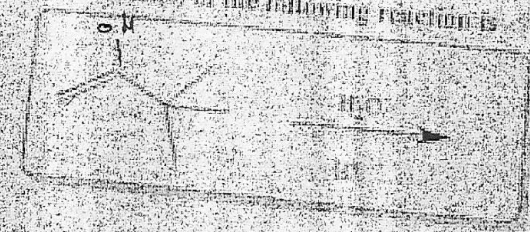




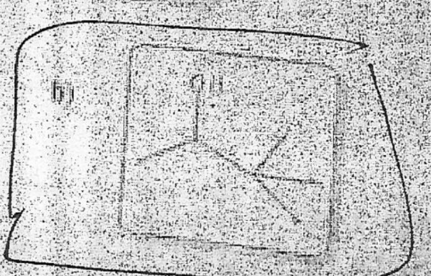
a) c < b < a

b) a < c < b
c) b < a < c
d) a < b < c

(17) The major organic product(s) of the following reaction is



a) OH

b)


c)


d) a+c

4
3
2
1

HBr

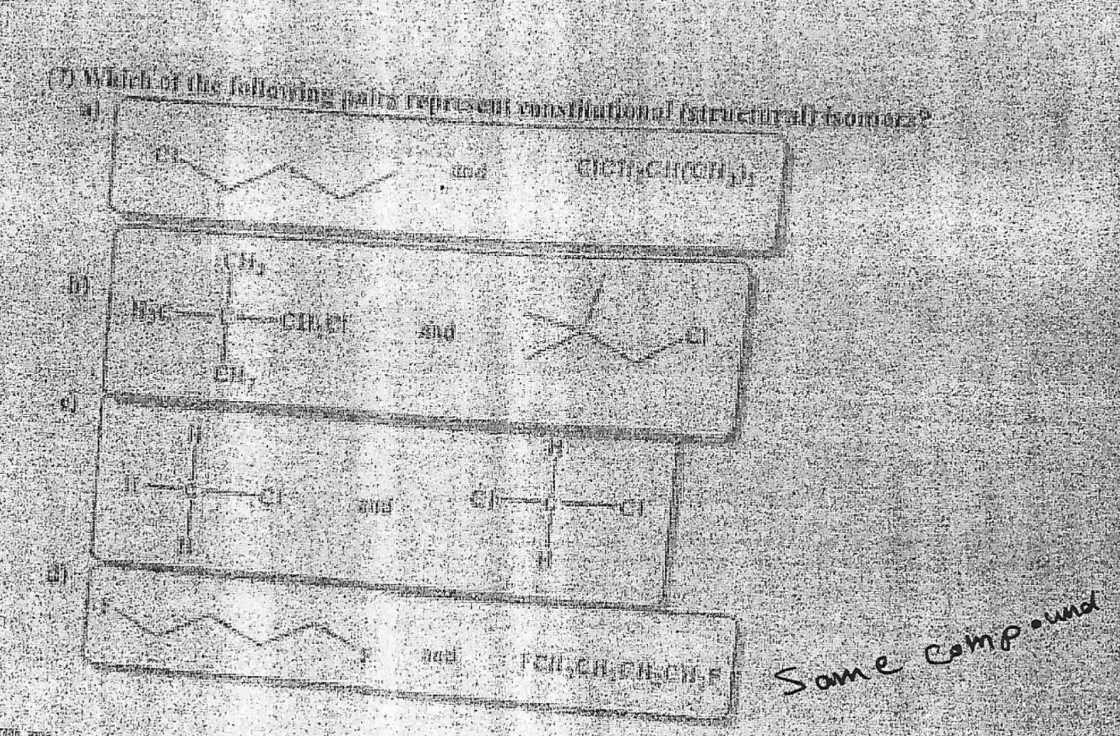
لانه الرابطة الثانية تنكسر

d) non of these

Na NH_2

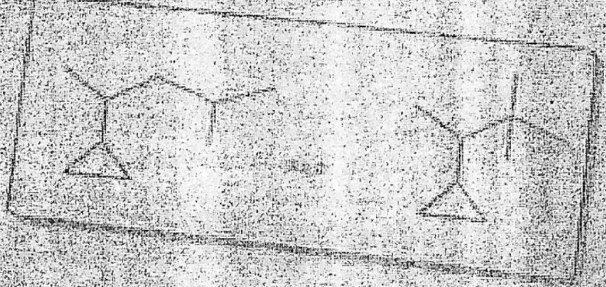
Br

(7) Which of the following pairs represent constitutional (structural) isomers?



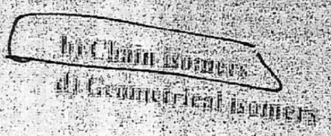
Same compound

(8) The following formulas represent:



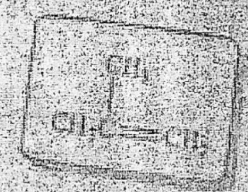
a) Functional group isomers
b) Chain isomers
c) Positional isomers
d) Geometrical isomers

(9) Consider chlorination of propane, what is the type of reaction?



a) Electrophilic substitution reaction
b) Electrophilic addition reaction
c) Free radical substitution reaction
d) Free radical addition reaction

(10) The common name of this compound is



a) Isobutylene
b) 2-Methylpropene
c) Propylene
d) a+b

20- The 3-Ethyl-4,4-dimethylhexane is incorrect name, the correct name for this compound is

a) 4-Ethyl-3,3-dimethylhexane
b) 3,4,4-Trimethylheptane
c) 3,3,4-Trimethylheptane
d) 4,4-Dimethyloctane

4-Ethyl-3,3-Dimethyl